

Handed out @ 11/21/06
mtg w/ CCT

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Human Health Assessment Consuming Fish from the Upper Columbia River Site

November 21, 2006

Questions:

Do pollutants in the Upper Columbia River threaten people?

Are people at increased risk?

Does pollution cause people to avoid the River or its resources? – concern for future exposures

The questions must inform EPA's CERCLA decision.

Why Risk Assessment?

- Determine whether actions are needed to protect people
- Gather information for cleanup decisions and subsequent design work
- Identify specific chemicals, exposure pathways, and scenarios which warrant “remedial action”

Exposure Scenarios

- Recreation by residents
- Recreational by visitors
- Workers
 - Construction & maintenance
 - Biologist & cultural resources
- Tribal Subsistence

Potential Sampling Media

- More Beach Sediment
- More Fish or Shellfish
- Game
- Riparian or Aquatic Plants
- Dust in air
- Groundwater/Surface Water

Exposure → Average Daily Intake

ADI = average daily intake (mg/kg/day)
EC_i = concentration in environmental medium *i* (mg/kg)
IR_i = intake rate of medium *i* (kg/day)
ED_i = exposure duration to medium *i* (day)
AT = averaging time (day)
BW = body weight (kg)

*intake associated with unacceptable risk

Reasonable Maximum Exposure

- Based on a high level of exposure to ensure an adequate, but reasonable level of protection
- Distinguishes between scenarios that are possible, but highly improbable, and those that are more likely to occur within a population, with the latter being favored in risk assessment
- Not an upper-bound estimate (i.e., an upper limit on what is possible) because it must occur within the realm of reasonable likelihood (e.g., ~95th percentile; not MAX)
- Entails judgment and uncertainty

Exposure Pathways

- Are all pathways and receptors represented?
- Which are likely to be the most significant pathways?
- What data are needed to evaluate each pathway?
 - Resource use and consumption survey
 - Contaminant levels in pathway media

Potentially Impacted Media	Exposure Route	Exposed Populations														
		Residential ⁷		Residential Recreation Adults	Residential Recreation Children	Non local Recreation Adults	Non local Recreation Children	Occupational	Subsistence* Adults	Subsistence* Children	CCT Resident Adults	CCT Resident Children	Spokane Tribe Resident Adults	Spokane Tribe Resident Children	Seasonal Residential ^{***}	
		Children	Adults												Children	Adults
Outdoor Air (PM10s)	Inhalation															
	Ingestion															
	Dermal															
Indoor Air (PM10s)	Inhalation															
	Ingestion															
	Dermal															
Indoor Dust	Inhalation															
	Ingestion															
	Dermal															
Surface Soil (Beaches)	Inhalation															
	Ingestion															
	Dermal															
Sediment (Beaches)	Inhalation															
	Ingestion															
	Dermal															
Surface Water	Inhalation**															
	Ingestion															
	Dermal															
Ground Water	Inhalation															
	Ingestion															
	Dermal															
Terrestrial Plants	Inhalation															
	Ingestion															
	Dermal															
Local Agricultural Products	Inhalation															
	Ingestion															
	Dermal															
Wild Game, Waterfowl	Inhalation															
	Ingestion															
	Dermal															
Livestock	Inhalation															
	Ingestion															
	Dermal															
Aquatic Animals	Inhalation															
	Ingestion															
	Dermal															
Aquatic Plants	Inhalation															
	Ingestion															
	Dermal															